



# **Model Application and Scenario Development**

**Presented by:  
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# So all this research . . . now what?

## Integration

- ✓ Pathway 2007, TMDL, and future management system

## Model Application

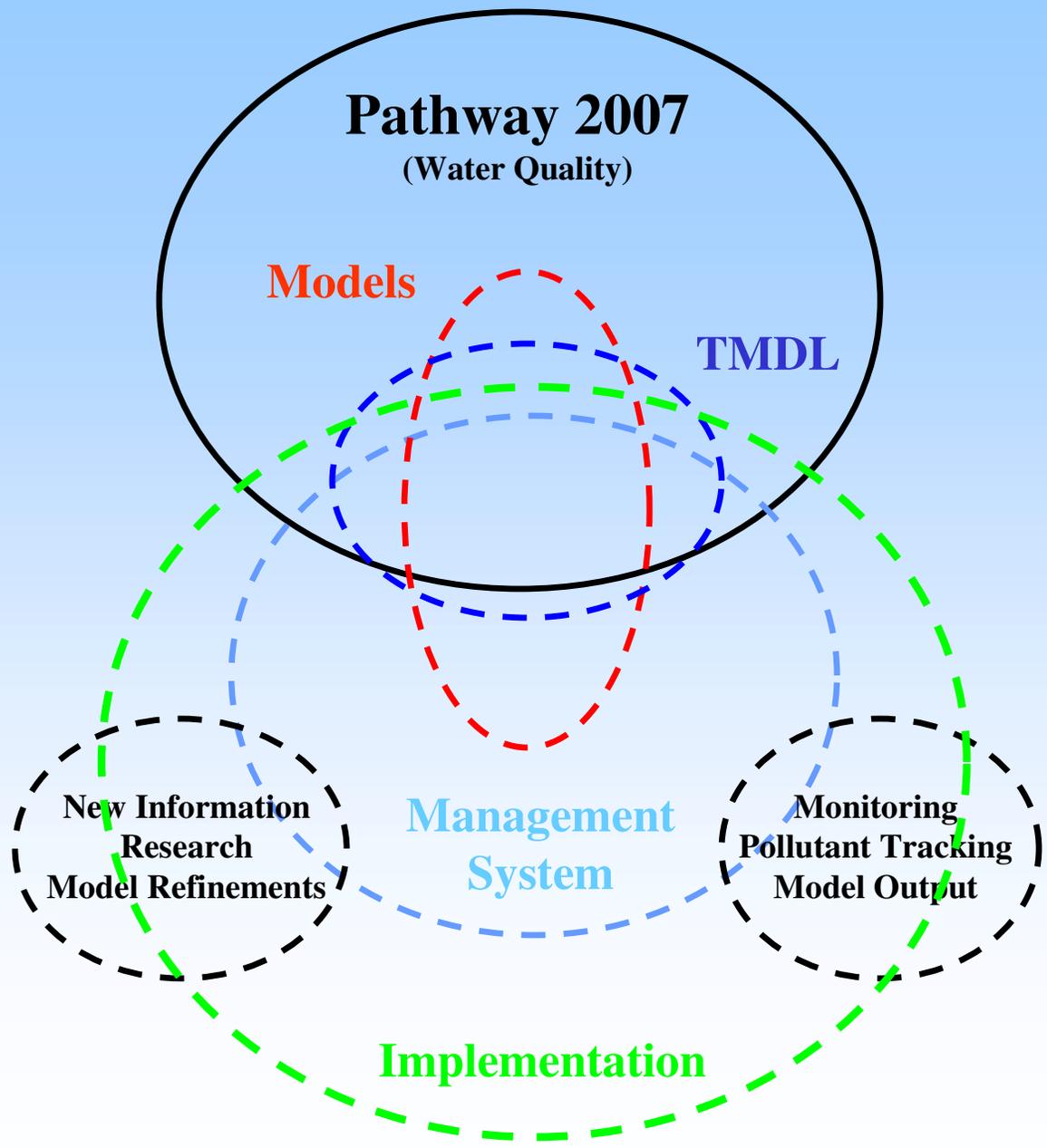
- ✓ TMDL
- ✓ Planning Process
- ✓ Management System

## “What if . . .” Scenarios

- ✓ Development
- ✓ Examples



**Lather  
Rinse  
Repeat**



**Time**  
↓



## **Applied Science**

- ✓ Platform for application of new information
- ✓ Integration of science and policy
- ✓ Use of existing information

## **Resource Management**

- ✓ Application to Pathway 2007
- ✓ “What if . . .” scenarios
- ✓ Loading estimates, hot spots, prioritization

## **Water Quality Objectives**

- ✓ Standards, Thresholds
- ✓ Pollutant Load Reduction Allocation

## **Implementation**

- ✓ Strategic Planning
- ✓ Planning and Implementation Tools

# TMDL Applications

## Atmospheric

- UCD - MM5 historic climate reconstruction

## Upland

- Tetra Tech - LSPC (Hydrology and Loading)
- Hydroikos - Statistical Modeling
- Geosyntech - SWMM (Pilot BMP modeling)

## Groundwater

- USACE - groundwater loading model

## Stream Channel Erosion

- National Sedimentation Laboratory - CONCEPTS/AnnAGNPS

## Lake Response

- UCD - Lake Tahoe Clarity Model (hydrodynamics, water quality, optical properties)



# TMDL Applications cont.

## Source Loading Estimation

- ✓ Major Source Categories, Land-use, 184 Modeled Sub-watersheds, Tributary Watersheds, Jurisdiction, Background

## Linkage Analysis

- ✓ Provides connection between pollutant sources and water body response

## Assimilative Capacity

- ✓ Total load reduction required

## Load Allocations

- ✓ Methodology yet to be determined
- ✓ Margin of Safety, Future Growth Potential, Source Categories, Land-use, Sub-watershed, Jurisdiction, Tributary, Loading Caps



# Pathway 2007 Applications

## Other Standards

- ✓ **Light Extinction Coefficient, Primary Productivity**

## Standards Consistency

- ✓ **Develop consistency between agency standards**

## “What if . . .” Scenarios

- ✓ **Develop scenarios in support of Pathway 2007 process**

## Air Quality, Soil Conservation, Transportation

- ✓ **Apply models and scenarios to Threshold and Regional Plan Updates**

## Assimilative Capacity

- ✓ **Identifies degree of effort needed**

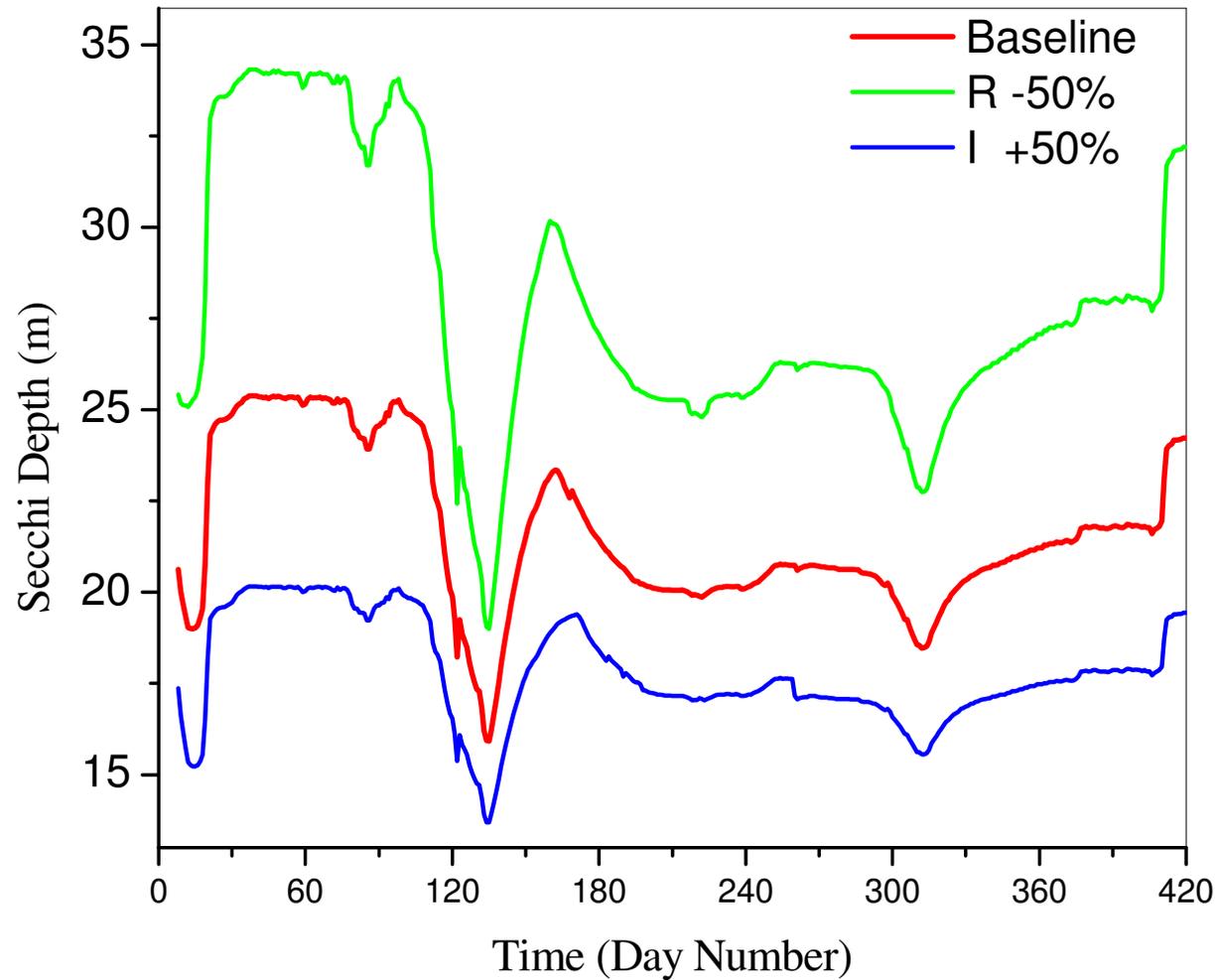
# **“What if . . .” Scenarios**

**Deterministic models provide opportunity to evaluate possible outcome of management scenarios**

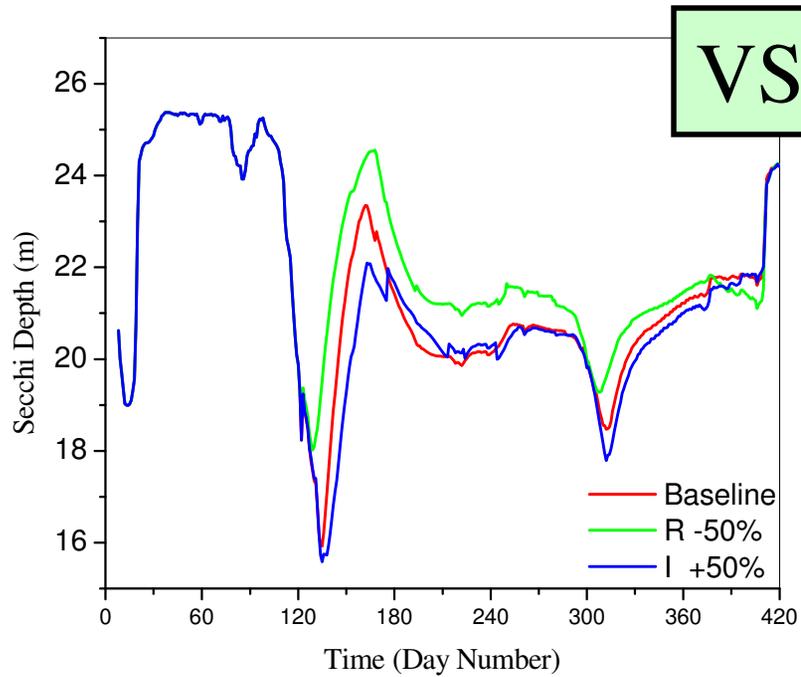
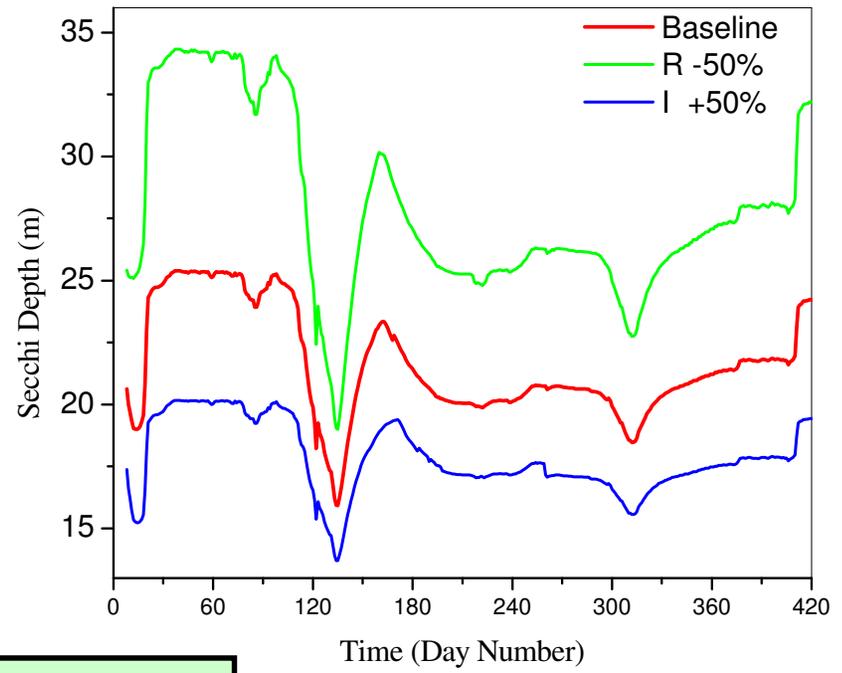
- ✓ **Scenarios will be developed through stakeholder process**
- ✓ **Water Quality Standards and Objectives**
- ✓ **Source Loading Changes**
- ✓ **Implementation Strategies**



# Conceptual Scenario Applications

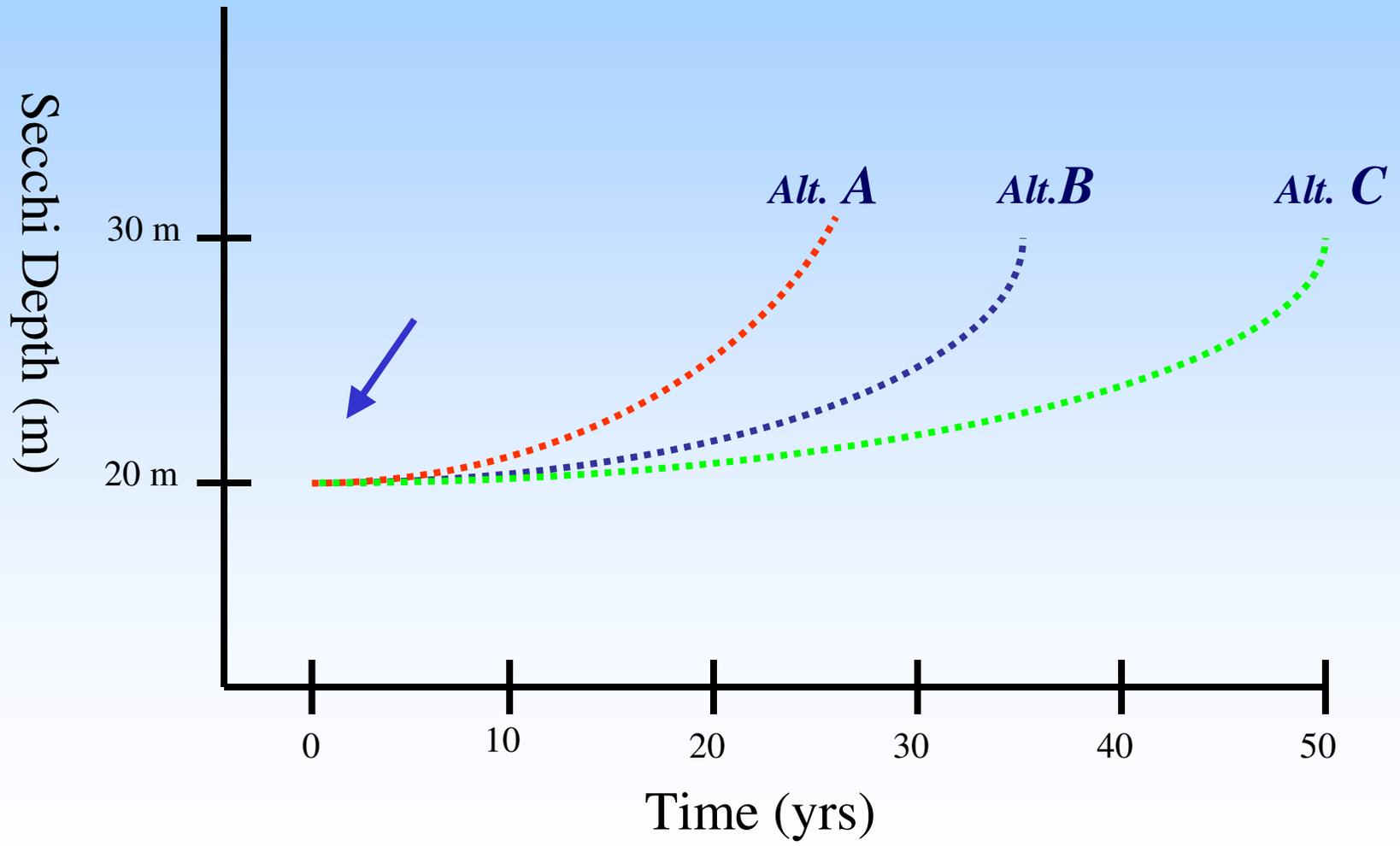


**Parameters are for illustrative purposes only**



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# Conceptual Clarity Improvement Curves



Parameters are for illustrative purposes only



# Management System Applications

## Refinement and updating

- ✓ Incorporate new information and research into models and estimates

## Research Prioritization

- ✓ Provides guidance on update needs and research requirements

## Hot Spot Identification

- ✓ Assist in development of implementation strategies
- ✓ Inform prioritization of restoration efforts

## Scenarios

- ✓ Evaluate relative benefit of implementation and regulatory options

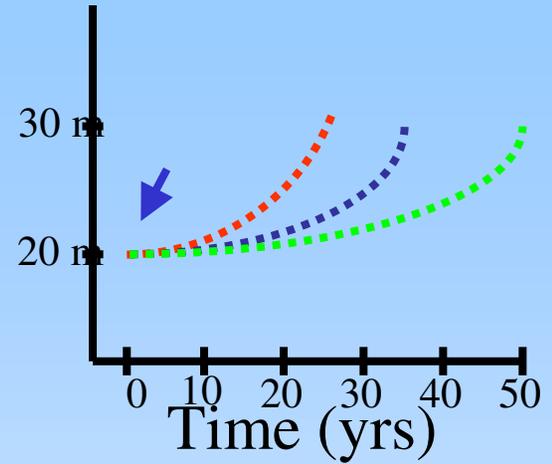
## Adaptive Management

- ✓ Provide tools and process for informed and appropriate modifications



**Restoration Effectiveness**

**Adaptive Management**



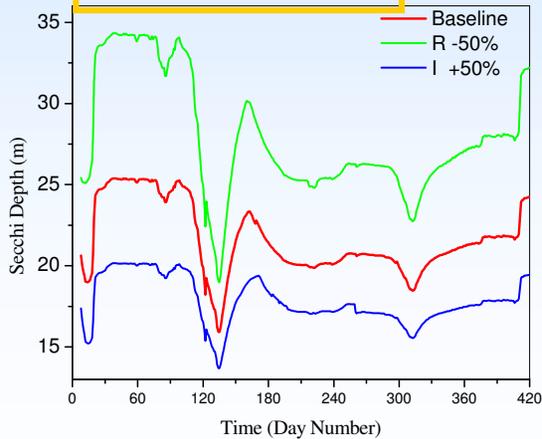
**TOOL BOX**

**BMPs**

**MONITORING**

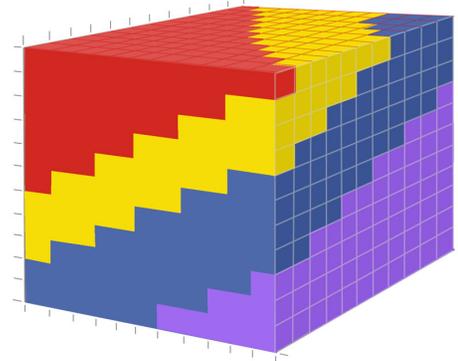
**Load Reduction Tracking**

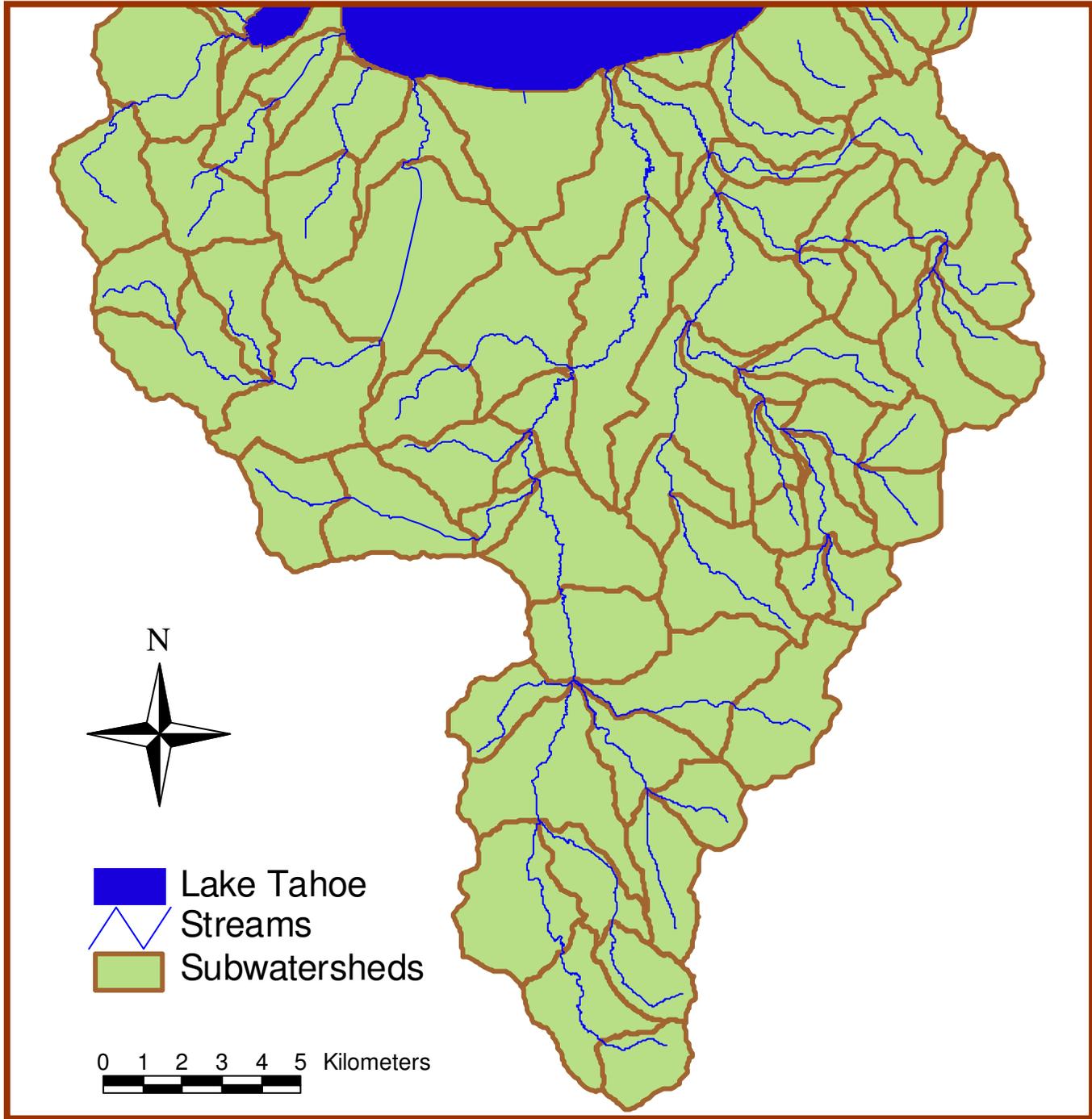
**SCENARIOS**



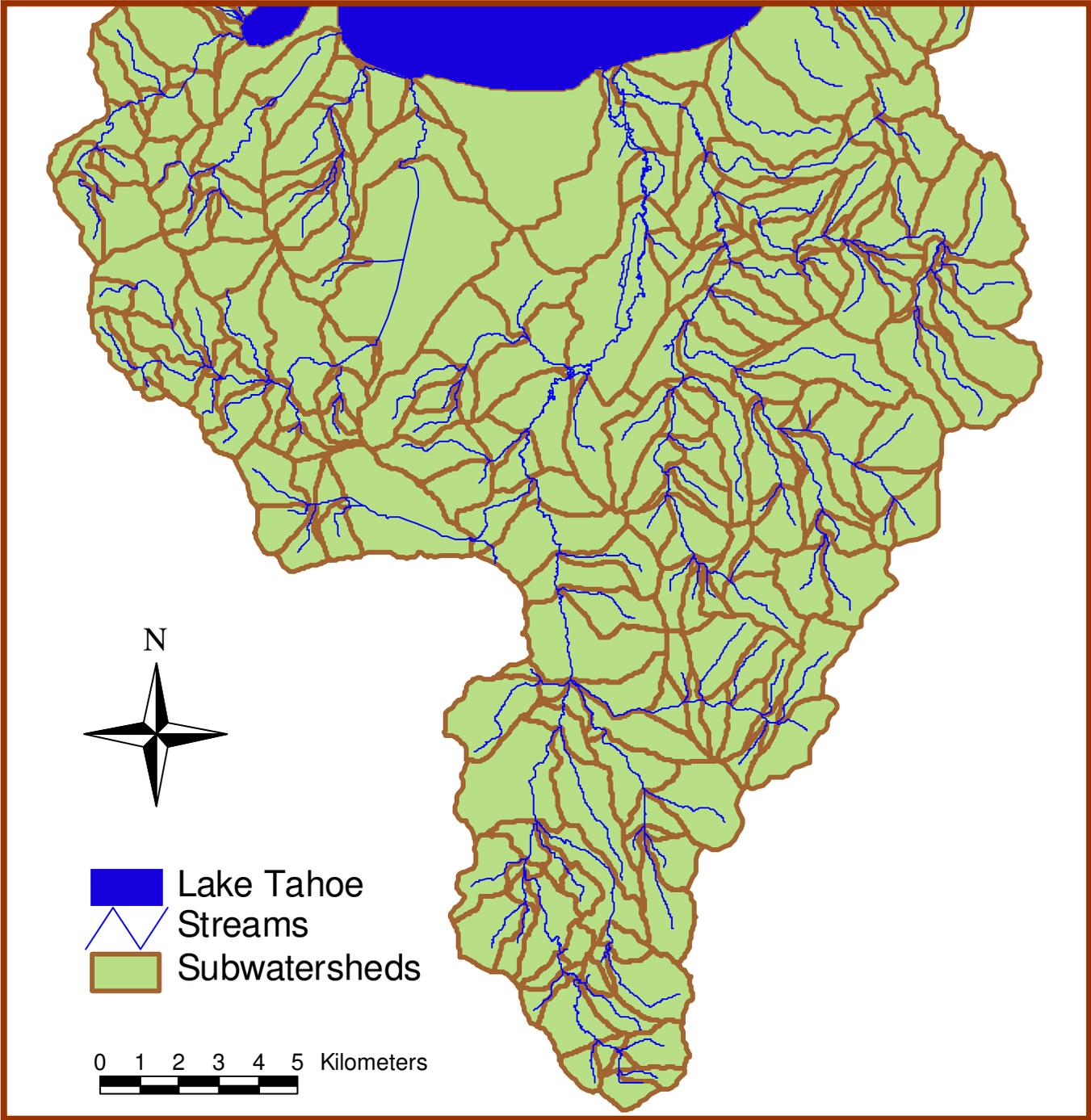
**New Science & Information**

**INNOVATION**





**184**  
Watersheds



**597**  
**Watersheds**



# **TMDL Implementation Tool Box**

## **Introduction**

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# Tool Box Objectives

- ✓ **Develop a unified set of planning and implementation tools**
- ✓ **Develop and apply tools needed for planning and implementation**
- ✓ **Integrate functionality between tools**
- ✓ **Develop system to update tools based upon new information**
- ✓ **Create forum for collaboration between agencies**
- ✓ **Centralize funding and resource needs**
- ✓ **Prioritize needed tools and supporting research**

# TOOLS

Watershed Model

Clarity Model

Land-use Maps

Atmospheric Deposition

Groundwater Loading

Stream Channel Erosion

TIIMS

**PHASE I**

Urban Hydrology

BMP Modeling

Basin-wide LYDAR

Storm Water Master Plans

????

**PROPOSED**

Reduction Estimation Methods

Load Reduction Matrix

New Technologies

Pollutant Trading Potential

Pollutant Tracking System

**PHASE II**





# **Presentations**

**Load Reduction Estimation Methodologies – Eric Strecker**

**Load Reduction Matrix – Jason Kuchnicki**

**New and Innovative Technologies – Jason Kuchnicki**

**BMP Model – Leslie Shoemaker**

**TIIMS – Dave Roberts**

**Pollutant Tracking and Progress Monitoring – John Reuter**

**Water Quality Trading Feasibility – Jack Landy**